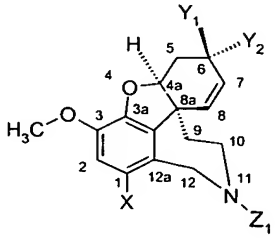
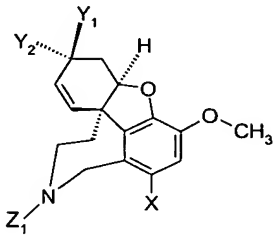
Claims:

1. New derivatives of 4a,5,9,10,11,12-hexahydrobenzofuro[3a,3,2][2] benzazepine with the general formulas Ia or Ib



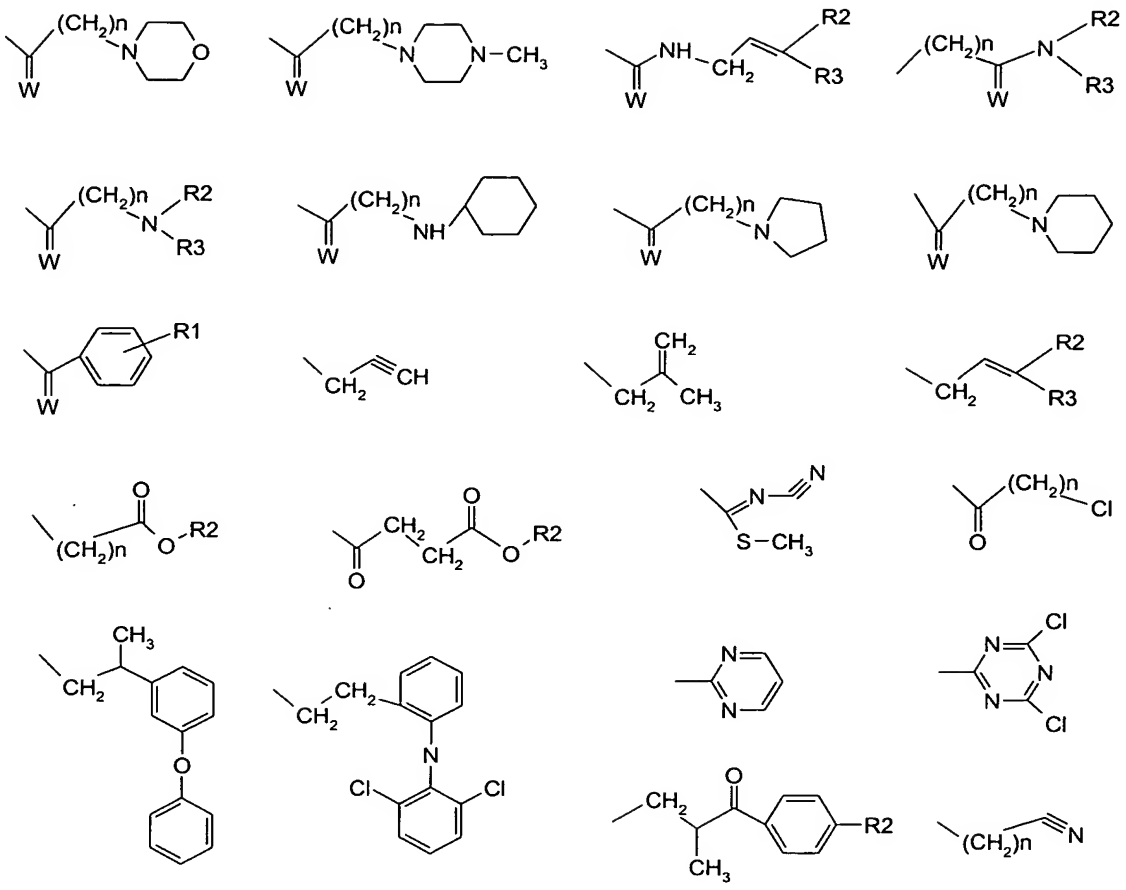
Ia



Ib

and their salts, where

- Ia represents optically active (-) derivatives of galanthamine and Ib represents optically active (+) derivatives of galanthamine, which occur in a mirror configuration, and in which
- Y_1 and Y_2 are alternately H or OH,
- X = H or Br and
- Z_1 = a group of the following formulas

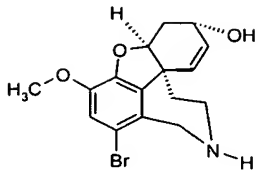
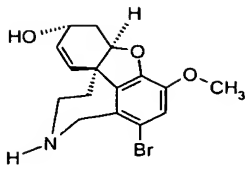
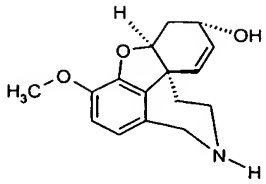
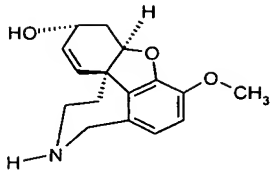


in which

- R_1 = H, Cl, Br, I, F, OH, linear or branched (C_1-C_6) alkyl, linear or branched (C_1-C_6) alkyloxy, NO_2, NR_2R_3,
- R_2 = R_3 = H, linear or branched (C_1-C_6) alkyl
- W = H, O, S
- n = 0 or 1-6

in which

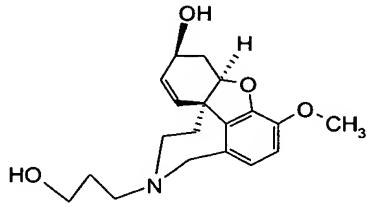
- Z_1 is equal to H solely for compounds **1, 3, 13** and **24**

1 **3** **13** **24**

where compounds **1** and **13** are (-) derivatives of 6-epinorgalanthamine and compounds **3** and **24** are (+) derivatives of 6-epinorgalanthamine, and in which

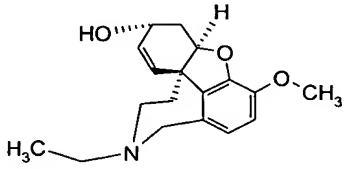
- Z_1 is equal to hydroxypropyl solely for the compound **29**



29

and

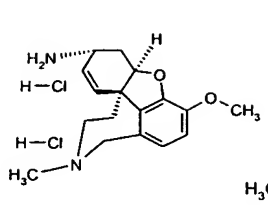
- Z_1 is equal to ethyl solely for the compound **26**



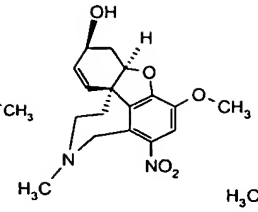
26

and

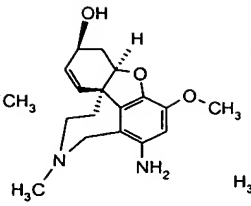
- Z_1 is equal to methyl solely for the following compounds



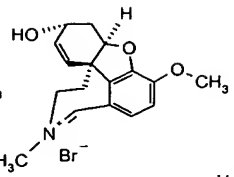
28



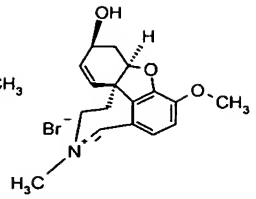
31 Step 1



31 Step 2



56

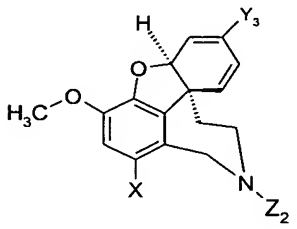


55

and

where compounds **29, 31** and **55** are (+) derivatives of galanthamine and compounds **26, 28** and **56** are (+)-epi derivatives of galanthamine.

2. New derivatives of 4a,5,9,10,11,12-hexahydrobenzofuro[3a,3,2][2]benzazepine with the general formula Ic



Ic

and their salts, where

- X is H or Br,
- Z_2 is H, linear or branched (C_1-C_6) alkyl, linear or branched (C_2-C_7) alkenyl, linear or branched (C_2-C_7) alkinyl and
- Y_3 is linear or branched (C_1-C_6) alkyl, phenyl, linear or branched (C_1-C_6) alkylphenyl, nitrophenyl, chlorophenyl, bromophenyl, aminophenyl, hydroxyphenyl.

3. A method for the preparation of compounds as in Claim 1, which is characterized by the fact that an optically active 11-norgalanthamine derivative is treated with dilute acid, preferably dilute hydrochloric acid.

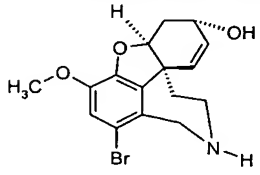
4. A method as in Claim 3, which is characterized by the fact that an optically active 11-norgalanthamine derivative is converted to a 6-epi derivative of galanthamine by treatment with dilute acid.

5. A method as in Claim 3 or 4, which is characterized by the fact that the steric configuration at carbon 6 is changed in the acid treatment, whereas the steric configuration at the asymmetric carbon atoms 4a and 8a remains unaltered.

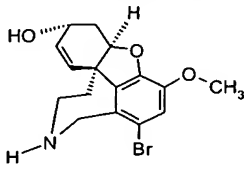
6. A method for the preparation of the compounds as in Claim 1 or 2, which is characterized by the fact that alkylation or acylation reactions are carried out in a solvent chosen from the group consisting of toluene, acetonitrile, ethanol, acetone, 2-butanone, dimethyl formamide or chloroform.

7. A method as in Claim 6, which is characterized by the fact that the compounds with the general formula Ic are prepared from the corresponding (-)-narwedine components by alkylation in a multistep Grignard reaction.

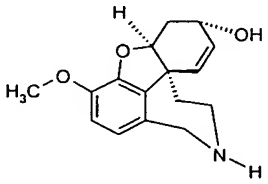
8. A method for preparation of compounds **1**, **3**, **13** and **24**



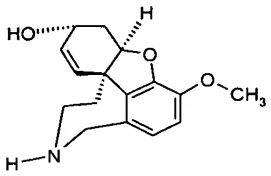
1



3



13



24

which is characterized by the fact that the corresponding starting compounds based on norgalanthamine are reacted in the presence of a base.

9. A method as in Claim 7, which is characterized by the fact that sodium hydrogen carbonate, potassium carbonate, sodium hydroxide, potassium hydroxide, triethylamine or pyrridine or mixtures thereof are used as base.

10. A method as in Claim 8 or 9, which is characterized by the fact that the base is used in an amount between 5 and 20 wt% with respect to 100 wt% starting product.

11. A drug containing one or more compounds Ia, Ib or Ic as a pharmaceutically active agent.

12. The use of one or more compounds Ia, Ib or Ic in pure form or in the form of their pharmaceutically safe acid addition salts to prepare a drug for the treatment of Alzheimer's disease or related conditions of dementia.

13. The use of one or more compounds Ia, Ib or Ic in pure form or in the form of their pharmaceutically safe acid addition salts to prepare a drug for the treatment of Parkinson's disease.

14. The use of one or more compounds Ia, Ib or Ic in pure form or in the form of their pharmaceutically safe acid addition salts to prepare a drug for the treatment of Huntington's disease (chorea).

15. The use of one or more compounds Ia, Ib or Ic in pure form or in the form of their pharmaceutically safe acid addition salts to prepare a drug for the treatment of multiple sclerosis.

16. The use of one or more compounds Ia, Ib or Ic in pure form or in the form of their pharmaceutically safe acid addition salts to prepare a drug for the treatment of amyotrophic lateral sclerosis.

17. The use of one or more compounds Ia, Ib or Ic in pure form or in the form of their pharmaceutically safe acid addition salts to prepare a drug for the treatment of epilepsy.

18. The use of one or more compounds Ia, Ib or Ic in pure form or in the form of their pharmaceutically safe acid addition salts to prepare a drug for the treatment of the consequences of stroke.

19. The use of one or more compounds Ia, Ib or Ic in pure form or in the form of their pharmaceutically safe acid addition salts to prepare a drug for the treatment of consequences of craniocerebral trauma.

20. The use of one or more compounds Ia, Ib or Ic in pure form or in the form of their pharmaceutically safe acid addition salts to prepare a drug for the treatment and prophylaxis of the effects of diffuse oxygen and nutrient deficiency in the brain such as are observed after hypoxia, anoxia, asphyxia, cardiac arrest, intoxications, narcosis and in the infant after complications in cases of difficult birth.

21. The use of one or more compounds Ia, Ib or Ic in pure form or in the form of their pharmaceutically safe acid addition salts to prepare a drug for the prophylactic treatment of apoptotic degeneration in neurons that have been or are being damaged by local radio- or chemotherapy of brain tumors.

22. The use of one or more compounds Ia, Ib or Ic in pure form or in the form of their pharmaceutically safe acid addition salts to prepare a drug for the treatment of bacterial meningitis.

23. The use of one or more compounds Ia, Ib or Ic in pure form or in the form of their pharmaceutically safe acid addition salts to prepare a drug for the treatment of diseases within an apoptotic component, especially in the wake of amyloid-associated cell degeneration.

24. The use of one or more compounds Ia, Ib or Ic in pure form or in the form of their pharmaceutically safe acid addition salts to prepare a drug and for the treatment of diabetes mellitus, especially when the disease is accompanied by amyloid degeneration of the islet cells.

25. The use of one or more compounds Ia, Ib or Ic in pure form or in the form of their pharmaceutically safe acid addition salts to prepare a drug for the treatment of postoperative delirium and/or subsyndromal postoperative delirium.

26. The use of one or more compounds Ia, Ib or Ic in pure form or in the form of their pharmaceutically safe acid addition salts to prepare a drug for the preventive treatment of postoperative delirium and/or subsyndromal postoperative delirium.